Virginia City Hybrid Energy Center
Response to Data Request
Hullihen Moore, Virginia Air Pollution Control Board

Question (Page No. 4):

In the January 7, 2008, Engineering Analysis, Staff states that the fuel proposed by Dominion, and the blend upon which the SO_2 PSD limit of .12lb/MMBtu is based, is 60% run-of-mine coal with heat content of 7,782 Btu/lb and maximum Sulfur content of 2.28% and 40% waste coal with heat content of 2,738 Btu/lb and Sulfur content of 1%. Staff advised me that the coal samples used to establish the SO_2 and other BACT limits were to be a "worst case scenario" and that the company might well use higher quality coal to meet the SO_2 and other limits included in the proposed permit. The January Engineering Analysis also states that "Dominion provided data on Mercury content of the various coal types proposed as fuel for the CFB boilers." The Analysis then states that the Mercury limit in the proposed January permit was based on "the coal fuel listed by Dominion with the highest Mercury content of 0.51 parts per million." Please provide a list and description of the "various coal types proposed as fuel for the CFB boilers." Also, provide the "coal fuel list" from which the 0.51 ppm Mercury content coal was taken. Was the same sample used for both the Sulfur and Mercury limits? Were other coals, coal types, or blends presented to, or otherwise considered by, Staff related to Sulfur, Mercury or any other substance. Staff also advised me that Dominion has not settled on a particular mine from which to purchase coal. Given that and the statements in the Analysis, there must have been a number of samples considered by the company and Staff with varying amounts of Sulfur, Mercury and other substances and varying Btu contents. Please provide a comprehensive list of all coals considered, showing which coals or samples were considered for Sulfur and each other substance that is limited or controlled by the proposed permits and identify which coal or sample was used with respect to each such limit or control. Please provide Btu and ash content and the content data for each substance that is limited or controlled by the proposed permits for each sample that was on any "lists" or was otherwise considered.

For each sample identified in III above as being used with respect to establishing limits or controls in the proposed permits, state the content of all substances controlled or limited by the proposed permits and the Btu and ash content of each such sample before washing, cleaning, treating, or otherwise preparing. (Repeat from III) Please state the impact of washing, cleaning, treating, or otherwise preparing each such sample for Btu and ash content and each substance limited or controlled by the proposed permits.

Response:

The tables below provide a comprehensive analysis of the various types of fuels that were sampled or evaluated for the VCHEC project, and actual mine names have not been included to protect proprietary information. Twelve fuels were selected to sample and evaluate. The twelve samples selected were from twelve different mines and are

representative of eight different coal seams in the general area of the project. As a clarification, the last table (Seam Analysis) was derived from samples that were taken by DMME and Miltech. Dominion did not participate in those sampling efforts.

The tables are self-explanatory. Please note that Mine #2 was chosen for the mercury (Hg) content of 0.51 ppmw as it was the highest mercury content among the twelve samples.

We have not performed any studies on the impact of washing these coals.

Ash Mineral Analysis

All data represented as Wt%

Mine ID	Mine #2	Mine #4	Mine #5	Mine #6	Mine #7	Mine #8	Mine #12	Mine #10	Mine #9	Mine #1	Mine #3	Mine #11
Silicon Dioxide	63.36	61.61	53.27	57.45	49.38	62.15	45.11	51.61	44.44	60.67	60.59	50.22
Aluminum Oxide	22.41	20.97	30.96	22.75	28.87	23.14	19.42	20.12	19.12	21.33	20.05	28.16
Titanium Dioxide	1.09	1.14	0.86	1.09	1.18	1.12	0.77	0.94	0.84	0.97	1.00	1.04
Iron Oxide	4.53	6.36	6.04	7.85	9.37	5.12	25.65	18.03	26.16	6.19	9.34	10.01
Calcium Oxide	1.29	1.63	0.58	1.75	2.87	1.60	1.39	1.55	1.40	0.85	0.63	2.45
Magnesium Oxide	1.71	1.86	2.11	1.59	1.96	1.45	1.66	1.72	1.72	2.57	2.20	1.72
Potassium Oxide	3.36	3.90	4.21	3.79	2.30	3.06	2.90	2.93	2.56	4.40	3.51	3.03
Sodium Oxide	0.49	0.56	0.51	0.58	0.67	0.50	0.68	0.67	0.62	0.77	0.47	0.60
Sulfur Trioxide	0.60	0.96	0.54	2.14	2.36	0.70	1.44	0.90	2.22	1.14	0.91	1.46
Phosphorus Pentoxide	0.15	0.19	0.19	0.22	0.33	0.18	0.36	0.35	0.32	0.22	0.33	0.35
Strontium Peroxide	0.03	0.02	0.02	0.02	0.06	0.03	0.09	0.10	0.14	0.10	0.12	0.08
Barium Oxide	0.10	0.07	0.17	0.10	0.28	0.07	0.29	0.32	0.34	0.20	0.21	0.37
Magnesium Dioxide	0.06	0.07	0.06	0.07	0.07	0.07	0.01	0.02	0.02	0.02	0.02	0.13
Not Determined	0.82	0.66	0.48	0.60	0.30	0.81	0.23	0.74	0.10	0.57	0.62	0.38
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Proximate and Ultimate Fuel Analysis

	Mine #2	Mine #4	Mine #5	Mine #6	Mine #7	Mine #8	Mine #12	Mine #10	Mine #9	Mine #1	Mine #3	Mine #11
	100	100	100	101	101	100	100	101	102	100	100	101
Volatile Matter, %	13.1	18.1	20.4	20.9	24.2	19.4	28.0	26.9	28.7	13.8	19.9	31.4
Fixed Carbon, %	20.8	25.4	31.1	34.3	39.3	46.0	53.1	51.8	50.6	16.2	17.8	54.1
Ash, %	**60.3**	**52.3**	**43.3**	**34.2**	**32.2**	**30.9**	**7.7**	**12.5**	**14.3**	**65.4**	**56.7**	**9.5**
Moisture, %	5.80	4.20	4.30	10.70	4.30	3.60	9.20	8.80	6.40	4.70	4.60	5.10
Sulfur, %	0.22	0.36	0.84	0.79	0.62	0.50	1.63	0.99	1.88	0.23	0.72	0.57
HHV (Btu/lb)	**4,330**	**6,342**	**7,711**	**8,094**	**9,694**	**10,052**	**12,843**	**12,209**	**12,187**	**3,473**	**5,129**	**13,285**
%C	27.6	34.1	42.1	44.0	53.9	54.8	71.5	68.2	67.6	24.1	30.6	75.3
%H	1.6	3.2	3.2	3.0	3.6	3.8	4.4	4.2	4.2	1.6	2.7	4.4
%N	0.8	0.9	0.8	0.9	1.0	1.1	1.2	1.2	1.2	0.8	0.9	1.3
%O	3.8	4.9	5.4	6.4	4.4	5.3	4.2	4.1	4.0	3.2	3.8	3.9
Dulong Eq. HHV	**4,722**	**6,561**	**7,696**	**7,803**	**9,735**	**9,897**	**12,828**	**12,121**	**4,249**	**12,225**	**5,808**	**13,399**

Trace Elements in Fuel

Trace Elements in Fuel All data presented in micro grams/gram												
Sb	4.0	1.8	2.8	1.7	3.2	1.4	0.5	0.4	0.5	3.3	3.9	1.8
As	40.5	23.5	41.9	27.4	35.2	15.2	13.5	12.6	16.0	48.6	56.6	20.3
Ba	555.4	365.3	695.2	325.7	841.1	210.6	479.0	485.0	525.6	1,399.1	1,269.2	325.7
Be	3.2	2.1	4.5	1.8	8.7	1.5	2.5	2.2	2.3	3.1	2.8	2.6
Cl	330.0	302.0	307.0	430.0	271.0	409.0	639.0	610.0	622.0	233.0	114.0	436.0
Cr	50.9	35.3	64.5	24.8	40.0	21.6	5.5	5.9	9.7	44.4	45.7	20.4
Co	22.5	14.9	21.0	12.2	23.0	8.2	3.5	3.6	5.7	11.8	13.9	7.7
Fl	42.1	48.1	49.2	43.4	47.9	52.3	74.1	69.2	59.2	199.0	255.2	50.2
Pb	46.2	29.8	45.9	20.2	43.5	19.5	3.1	4.1	5.9	22.5	27.2	14.7
Hg	0.51	0.34	0.49	0.25	0.47	0.28	0.06	0.07	0.08	0.40	0.42	0.20
Ni	41.7	22.8	43.8	17.7	37.4	13.1	8.1	6.3	11.2	41.9	39.9	9.9
Se	6.6	4.8	7.5	3.0	5.8	2.5	0.1	0.2	0.2	1.2	1.3	2.2
Sr	178.9	70.0	70.2	60.8	169.4	69.4	139.0	142.7	222.4	696.2	720.5	68.1
Mn	296.2	274.4	202.4	182.5	172.2	171.6						92.7

Trace Elements by Seams Data from DMME and Miltech Data

	F max	Pb max	Cl max	Hg max	# of Samples
Tiller	860	46	910	0.51	**7**
Jaw	260	30	355	0.41	**10**
Kennedy	340	19	670	0.50	**14**
LBanner	180	46	300	0.37	**12**
UBanner	510	43	230	0.47	**25**
Dorch	840	61	470	0.39	**57**
Splash	260	10	1100	0.41	**21**
Aily	820	20	430	0.25	**3**
Average	509	34	558	0.41	